

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the subject application.

Listing of Claims:

What is claimed is:

1. (Currently Amended) A ~~method~~process of providing corrosion protection for a metal by coating said metal with a thiol compound, comprising: ~~the steps of~~

a. dissolving or dispersing said thiol compound in a solvent and preparing a solution or dispersion,

b. treating said metal with said solution or dispersion,

c. drying or curing the treated metal, wherein a coating consisting essentially of said thiol compound is formed, and

thereby increasing the corrosion resistance of said metal without using chrome, and wherein said metal is selected from the group consisting of hot rolled ~~and pickled~~ steel sheet, cold-rolled steel sheet, hot-dipped metallic coated steel sheets, electroplated metallic coated steel sheets, aluminum sheets, aluminum alloy sheets, zinc sheets, and zinc alloy sheets, ~~and gold~~.

2. (Previously Presented) A process according to Claim 1 wherein said thiol compound has the general formula, $R(CH_2)_nSH$, where R is selected from the group consisting of methyl, carboxyl, hydroxyl, formyl, and amide, and n is in the range of 7 to 21.

3. (Previously Presented) A process according to Claim 1 wherein said thiol compound is 1-octadecanethiol.

4. (Cancelled)

5. (Previously Presented) A process according to Claim 1 wherein said metal includes coatings of one or more layers selected from the group consisting of lead, lead alloy, nickel, nickel alloy, zinc, zinc layer, tin, and tin alloy.

6. (Previously Presented) A process according to Claim 1 wherein said metal is galvanized, electro-galvanized, phosphated, resin-coated, or combinations thereof prior to treating with said thiol compound.

7. (Previously Presented) A process according to Claim 1 wherein said solvent is selected from the group consisting of alcohols, glycols, acetone, toluene, ethyl acetate, hexane, furan, tetrahydrofuran (THF), methylene chloride, ethers, formic acid, formamide, N,N-dimethyl formamide, acetonitrile, alkanes, turpentine, benzene, butyl acetate, petroleum ester, xylene, carbon tetrachloride, mineral spirits, and water; and combinations thereof.

8. (Previously Presented) A process according to Claim 7 wherein said solvent is selected from the group consisting of ethanol, 1-propanol, 1-butanol, and mixtures thereof.

9. (Previously Presented) A process according to Claim 1 wherein the concentration of said thiol compound is in the range of 1 to 500 millimoles per liter.

10. (Previously Presented) A process according to Claim 1 wherein said metal substrate is coated with said solution or dispersion by using a means selected from the group consisting of immersion, spray, painting, roll coating, and flow coating.

11. (Withdrawn) A process according to Claim 1, wherein said metal is coated with said solution or dispersion by immersion.

12. (Withdrawn) A process according to Claim 11 wherein said metal is immersed in said solution or dispersion for a period ranging from 3 seconds to 15 minutes.

13. (Currently Amended) A ~~method~~process of providing corrosion protection for a galvanized steel by coating said steel with a thiol compound, comprising: ~~the steps of~~

a. dissolving or dispersing said thiol compound in a solvent and preparing a solution or dispersion,

b. treating said galvanized steel with said solution or dispersion,

c. drying or curing the treated galvanized steel, wherein a coating consisting essentially of said thiol compound is formed and

thereby increasing the corrosion resistance of said galvanized steel without using chrome.

14. (Original) A process according to Claim 13 wherein said galvanized steel is electro-galvanized.

15-16 (Cancelled)

17. (Cancelled)

18. (New) A process of providing corrosion protection for a metal by coating said metal with a thiol compound, comprising:

a. dissolving or dispersing said thiol compound in a solvent and preparing a solution or dispersion,

b. treating said metal with said solution or dispersion,

c. drying or curing the treated metal, and

thereby increasing the corrosion resistance of said metal without using chrome, and wherein said thiol compound has the general formula, $R(\text{CH}_2)_n\text{SH}$, where R is selected from the group consisting of $(-\text{NH}_2)$, $(-\text{COOH})$, $(-\text{COO}-)$, $(-\text{OH})$, $(-\text{CONH}_2)$, $(-\text{COH})$ and n is in the range of 7 to 21.

19. (New) A process according to Claim 18, wherein said metal is selected from the group consisting of hot rolled steel sheet, cold-rolled steel sheet, hot-dipped metallic coated steel sheets, electroplated metallic coated steel sheets, aluminum sheets, aluminum alloy sheets, zinc sheets and zinc alloy sheets.

20. (New) A process according to Claim 18, wherein said metal includes coatings of one or more layers selected from the group consisting of lead, lead alloy, nickel, nickel alloy, zinc, zinc layer, tin, and tin alloy.

21. (New) A process according to Claim 18, wherein said metal is galvanized, electro-galvanized, phosphated, resin-coated, or combinations thereof prior to treating with said thiol compound.

22. (New) A process according to Claim 18, wherein said solvent is selected from the group consisting of alcohols, glycols, acetone, toluene, ethyl acetate, hexane, furan, tetrahydrofuran (THF), methylene chloride, ethers, formic acid, formamide, N,N-dimethyl formamide, acetonitrile, alkanes, turpentine, benzene, ethyl or butyl acetate, petroleum ester, xylene, carbon tetrachloride, mineral spirits, and water; and combinations thereof.

23. (New) A process according to Claim 18, wherein the concentration of said thiol compound is in the range of 1 to 500 millimoles per liter.